THE REVIEW

DEVOTED TO THE INTERESTS OF THE AMERICAN SOCIETY FOR METALS

Volume XII — MAY, 1939 — No. 5

Chicago Convention Committee Named, Headed by Clarage

A "Chicago Convention Committee" has been appointed by the Board of Trustees of the American Society for Metals to take care of local arrangements for the National Metal Congress and Exposition opening in that city on Oct. 23.

Arthur Clarage

Arthur T. Clarage, president, Columbia Tool Steel Co., and past treasurer, American Society for Metals, has been selected to act as chairman of the Committee.

The personnel of the Committee consists of H. A. Anderson, Western Electric Co.; R. S. Archer, Republic Steel Corp.; R. G. Guthrie, Peoples Gas, Light and Coke Co.; K. H. Hobbie, Driver-Harris Co.; W. E. Remmers, Electro Metallurgical Corp.; and H. S. Van Vleet, American Can Co.

R. E. McFarland, Western Electric Co., and chairman, Chicago Section of the American Welding Society, is a member of the Committee, representing the A.W.S.

This Committee has been organized for the purpose of furthering all local arrangements for the Congress, such as Chicago representation at the National Metal Exposition, a program of plant visitations, ladies entertainment and other activities.

Compliments

To Gilbert E. Doan, on his promotion to head of the department of metallurgical engineering, Lehigh University, succeeding Bradley Stoughton, who relinquishes his administrative duties under an age rule but continues on the teaching faculty.

To George L. Kehl, on his promotion from instructor to assistant professor of metallurgical engineering at Lehigh University.

To William C. Schulte, assistant professor of mechanical engineering, on selecting the 1939 Metals Handbook for use as a text in some of the classes at Rutgers University.

To C. R. Culling, vice-president, Carondelet Foundry Co.; Peter E. Rentschler, president, Hamilton Foundry & Machine Co.; D. A. Cullinan, president, Western Foundry Co.; and A. C. Denison, president, Fulton Foundry & Machine Co., all A.S.M members, on their nomination as directors of the Gray Iron Founders' Society, Inc.

To Bradley Stoughton, national treasurer A.S.M., on his election as honorary member of the Yale Engineering Association.

To Arthur W. F. Green, formerly production engineer, Allegheny Ludlum Steel Corp., on his appointment as research metallurgist, Pratt & Whitney Aircraft Div., United Aircraft Corp.

Philadelphia Celebrates Its 20th Birthday

Vice-President Gill Speaks at Meeting Commemorating Founding of Chapter in 1919

By A. O. Schaefer

Philadelphia Chapter—Twenty years have passed since 17 metals-minded Philadelphians met and decided that they and their ilk should have a society or organization in their home town.

Later in that same month 20 years ago, the infant organization gathered a crowd of 250 persons (counting wives) to its first public meeting. That rising young metallurgist, William H. Eisenman, addressed the gathering on the subject of "Heat Treatment—Its Past, Present, and Future". The date was March 21, 1919.

On March 31, 1939 the present Philadelphia Chapter held a birthday party to celebrate its first 20 years of existence. There was a birthday cake with 20 candles, some cracked tenor renditions of "Happy Birthday to You", and—best of all—eight of the original founders of the Chapter.

These included A. L. Collins, G. W. Tall, E. B. Estabrook, W. M. Mitchell, G. W. Keller, F. T. Chapman, J. J. Crowe, and V. B. Fisher.

With all the furore about the birthday party, two very excellent talks should not be overlooked.

F.B.I. Officer Speaks

The dinner meeting was addressed by E. P. Coffee, director of the Laboratory of the Federal Bureau of Investigation, on "Scientific Crime Detection". Everyone left with a feeling of hopelessness on the possibility of erasing or correcting documents, or even of writing anonymous letters. Even obliterated stamping on metal objects is not safe against the scrutiny of Mr. Coffee and his assistants.

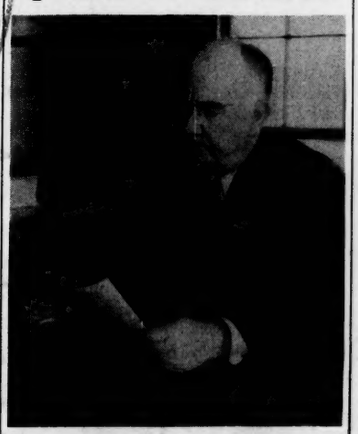
But the *pièce de résistance* of the evening was a most informative address by our vice-president, the Honorable James Gill on "Modern High Speed Steels and Their Heat Treatment".

This was Mr. Gill's 160th address delivered to an A.S.M. chapter. In it he evidenced all the mastery gained by experience, the assurance based on his unsurpassed knowledge of the subject, and the familiarity of his large acquaintanceship among the members.

A long discussion climaxed an excellent talk and a stimulating meeting.

The occasion was further enhanced by the presence of Col. A. E. White who told of some of his early experiences in A.S.M., and by Prof. Bradley Stoughton.

Speaks on Defense



General C. T. Harris, Jr., Who Spoke on Industrial Mobilization and Strategic Materials at the Boston Chapter Sustaining Members Night.

Boston Hears About Military Preparedness

Meeting Devoted to Industrial Mobilization and Place of Minerals in National Defense

By A. J. McDuff

Boston Chapter entertained its sustaining members and had as invited guests the local post of the Army Ordnance Association on April 7. There were 200 at the dinner and an additional 65 came to hear the address.

At the Boston Chapter's annual "Sustaining Members' Night" the principal address usually concerns a pertinent topic of national interest. In the recent past questions of business management and economy have been discussed ably by masters in the field.

This year, when public attention has been directed toward military preparedness, the meeting was devoted to questions of industrial mobilization and specifically to the place of minerals in national defense.

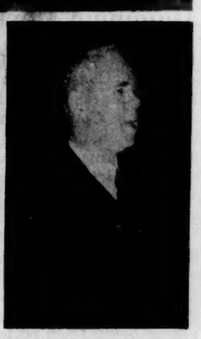
The Chapter was fortunate in securing General C. T. Harris, Jr., recently in charge of industrial planning in the office of the Assistant Secretary of War, and at present assistant to the Chief of Ordnance and Chief of the Industrial Service Division. It is probable that no other man in the country is better qualified to discuss these important phases of military preparedness.

Stressing the importance of industrial mobilization in the early stages of war preparations, General Harris told of the creation of the Army and Navy Munitions Board which is charged with the coordination of all procurement planning of the two services. The Industrial Mobilization Plan, as worked out by this Board, lays down broad policies and contains the provisions considered necessary for mobilizing the nation's industries.

Of the elements involved in mobilizing a nation for war—manufacturing capacities, labor, power, fuel, trans-

(Continued on page 8)

8 Founder Members at Birthday Party



Top: Eight of the Original 17 Men Who Founded the Philadelphia Chapter in 1919. Left to right: E. B. Estabrook, J. J. Crowe, W. M. Mitchell, A. L. Collins, G. W. Tall, F. T. Chapman, V. B. Fisher, and G. W. Keller.

Bottom: J. P. Gill Was the Principal Speaker, Past Chairman J. J. Crowe Cut the Cake, and First A. S. M. President A. E. White Reminisced.

Nominations for A. S. M. Officers and Trustees

The following nominations for officers of the American Society for Metals were made by the Nominating Committee, consisting of Gordon T. Williams, chairman; John S. Marsh, Neil P. Petersen, S. H. Graf, G. C. Riegel, R. W. Schlumpf, and Hyman Bornstein, meeting at the Palmer House in Chicago on May 19:

President (1 year)—James P. Gill, chief metallurgist, Vanadium-Alloys Steel Co., Latrobe, Pa.

Vice-President (1 year)—Oscar E. Harder, assistant director, Battelle Memorial Institute, Columbus, Ohio.

Treasurer (2 years)—Kent R. Van Horn, research metallurgist, Aluminum Co. of America, Cleveland.

Trustees (2 years)—H. J. French, in charge of alloy steel and iron development, International Nickel Co., New York, and Marcus A. Grossmann, director of research, Carnegie-Illinois Steel Corp., Chicago.

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JAMES P. GILL, *Vice-President*
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RAY T. BAYLESS.....*Editor*
M. R. HYSLOP.....*Managing Editor*

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Special Program for High School Students Attracts 580 Boys

Notre Dame Meeting Is Second Step in Spreading Metallurgical Knowledge in District

By George E. Stoll

Notre Dame Chapter—More than 580 students from 12 northern Indiana and southern Michigan high schools attended the first special student program of Notre Dame Chapter on April 12.

This was the second step in the promulgation of knowledge of the science of metallurgy for high school students of this area.

Two years ago the Notre Dame Chapter arranged to have copies of each issue of METAL PROGRESS placed in the libraries throughout the Michiana area. This marked the first step in the Chapter's campaign to acquaint youth with the science of metals.

The program for the day began with the inspection of the laboratories of the Notre Dame metallurgy and other departments. Dinner was served later in the University dining hall followed by the sound motion picture "Steel, Man's Servant".

Waterhouse Outlines Possible Careers

Career possibilities for young men and women in the vast field of iron and steel were discussed by George B. Waterhouse, professor of metallurgy at Massachusetts Institute of Technology, and past president A.S.M.

Dr. Waterhouse, who has achieved far-reaching renown in his field, verbally diagrammed the opportunities under four headings: Research, production, heat treatment and inspection, and management. Under each division he pointed out the preparation necessary, the type of work carried on, and the remuneration likely to be received.

The animated discussion following the address proved conclusively that the high school students here welcome the opportunity for learning something about the science of the metals which have such an important place in our modern civilization.

E. G. Mahin, head of the Notre Dame department of metallurgy, asked the students whether they would like to have another such meeting. Hundreds responded with an enthusiastic "yes!"

Many high school teachers were present and expressed as much enthusiasm as the boys. Indeed this venture, planned as an experiment in the spreading of metallurgical education, was pronounced an overwhelming success.

Variety of Events Highlight Two-Day Meeting of Six Chapters at Rochester

By Randall J. Salzer

Rochester Chapter—The most noteworthy event in the history of the Chapter was the inauguration of the two-day regional meeting for the Buffalo, Ontario, Rochester, Southern Tier and Syracuse Chapters, held April 21 and 22, at the University of Rochester.

The group was honored by the presence of National Secretary William Eisenman who, in his own inimitable way, diverted from the serious "academic and technical" to bring out the smiles. It was regretted that National President William P. Woodside was unable to attend because of illness.

The highlight of the two-day session was the dinner held Friday evening, which 300 members including 80 from out of town, enjoyed.

Dean L. A. DuBridge, University of Rochester, gave the address of welcome. The guests were introduced by Carl L. Bausch, of the Bausch and Lomb Optical Co.

Speaks on Super Finish

Following the dinner, the group adjourned to the Strong Auditorium to hear D. A. Wallace, president of Chrysler Sales, speak on "Super Finish".

He stressed what little research work has been done on the subject of "finish", particularly when finish represents one of the important factors in this mechanical age. The early history, development, advantages, and applications of "Super Finish" were presented with the simplicity, logic, and color that is characteristic of Mr. Wallace.

Probably of equal interest were the plant inspection trips. Rochester industries that had open house for the group were the American Laundry Machine Co., Bausch and Lomb Optical Co., Consolidated Machine Tool Co., General Motors (new plant), Gleason Works, Eastman Kodak Co., Taylor Instrument Co., and the Symington-Gould Corp.

Atom Smasher Demonstrated

The lecture and demonstration on the "Atom Smasher" by Dean L. A. DuBridge was an event long to be remembered. Following the lecture, the group was given the opportunity to witness the smashing of atoms and to wander through the laboratory housing the intricate mechanism and controls necessary to operate the atom smasher.

The technical papers were outstanding. While academic, they were all presented in a practical, easily understood manner. The subjects were:

Flame Hardening, by Stephen Smith, Air Reduction Sales Co.

Tools for Hot Working, by H. E. Replogle, Crucible Steel Co.

Heat Treatment by High Frequency Induction, by L. C. Conradi, International Business Machines Corp.

Forgeability of Steel and Other Alloys, by O. W. Ellis, Ontario Research Foundation.

Alloying Effects of Deoxidizers in Steel, by Walter Crafts, Union Carbide Co.

The outstanding success of this session can be attributed largely to the efforts of Prof. William J. Conley, chairman of the Rochester Chapter, who conceived and developed the idea of the two-day regional session.

Aluminum Movies Shown

By G. E. Healy

Oregon Chapter—At the meeting on Friday, March 10, F. S. Smith of the Aluminum Co. of America showed two very fine sound motion pictures, "Aluminum: Mine to Metal" and "Aluminum Fabricating Processes".

Mr. Smith in his talk traced the development of aluminum production from its isolation in 1825 to the present. Today 35% to 40% of the annual output of aluminum is used in the transportation industries—automotive, aircraft, and railroads, the modern airplanes being from 80 to 90% aluminum alloy by weight.

He outlined the various classes of aluminum alloys and their uses, and after the talk answered many questions asked by those present.

New Handbook Lauded By Members; 6000 Sent

"To my knowledge, no book at any time has ever represented the collection of precise and detailed information contained [in the new 1939 Metals Handbook]. In addition, the information is of the most useful variety and indispensable. In fact, I feel the book is indispensable to anyone engaged in any metal manufacturing".

This opinion of the new 1939 edition of A.S.M. Metals Handbook, quoted from a letter written by a prominent member of the Society, is only one of the many expressions of approval being received daily.

The new Handbook, greatly enlarged and thoroughly revised over the 1936 edition, is rapidly being distributed to members of the Society, nearly 6000 books having already been exchanged.

Before receiving the new edition, members must send in their old 1936 edition to the American Society for Metals, 7016 Euclid Ave., Cleveland, Ohio, and the new Handbook will be sent promptly, free and postpaid.

Members may purchase additional copies at a special price of $7.50.

New Haveners Visit New Rolling Mill of Bridgeport Brass Co.

By A. F. Holden

New Haven Chapter had an excellent plant inspection on April 20, at the new rolling mill of the Bridgeport Brass Co.

About 250 members were guided through the plant by special men assigned by the company. The sight of the latest machinery in this line coordinated perfectly and working at full speed was a thrilling experience.

After the plant visitation most of the members adjourned to the Algonquin Club for bowling until the dinner hour. The dinner was arranged particularly to honor the sustaining members who were presented with plaques, especially designed for the purpose, by Chairman A. B. Pollard.

A fine coffee talk was given by George S. Hawley, president of the Bridgeport Gas Light Co., on the proper methods and technique for photography, particularly for amateur enthusiasts.

Technical Chairman Alan Morris of the Bridgeport Brass Co. introduced the speaker of the evening, Ralph Cleveland of the Chromium Corp. of America. Mr. Cleveland gave a very interesting talk on the use of chromium and illustrated this by pictures showing some exceptional applications.

One important point is the necessity of having a good surface to start with. If the metal has any pits, cyanide copper plate should be used first followed by an acid copper which has considerably more cover than a great many of the other materials used as a base for chromium.

However, the selection of a base metal or the use of a chromium plate depends largely on the application.

The Executive Committee is to be complimented on the program.

"Information Please" Course Provides Novel Method of Imparting Knowledge

By A. J. McDuff

Under the capable leadership of George Burnett of Hartell Brothers Co., a new and novel method was devised this year by the Boston Chapter for imparting metallurgical knowledge to the unsatiated minds of this ever-increasing group of pursuers of higher knowledge.

The *modus operandi* was started by getting the Chapter members to send to George unsigned questions on a printed form. The response was most prolific. The psychological effect of asking questions incognito manifested good leadership from the start.

Over 100 questions were received on every phase of metallurgy—every type of heat treatment including non-ferrous; quenching mediums (internal consumption not included); selection of steels; methods of testing; and many aspects of the physics of metal.

George realized then he had a real job on his hands and it was no longer a case of "Let George do it". So George, being of the resourceful type, went ahead and got himself some well-tempered tools in the form of an advisory committee, namely:

John T. Norton, Massachusetts Institute of Technology; Paul D. Ffield, Bethlehem Shipbuilding Corp.; H. H. Lester, Watertown Arsenal; R. F. Harrington, Hunt Spiller Mfg. Corp.; J. V. Baxter, United Shoe Machinery Corp.

Fine tools they turned out to be. All were well seasoned in their own particular atmospheres—even their tempers were never in want.

The questions were listed numerically, pondered over and segregated by the advisory committee, who then selected Boston Chapter members best qualified to answer questions in each particular field.

The course was divided into five weekly sessions. At each session four of the selected "Wise Men" served on a panel with a technical chairman.

Each was given four questions for preparation at least one week before his zero hour. Five minutes were allowed for delivering the answers.

Oral Questions Follow Written

After all written questions were answered, the neophytes from the floor interrogated the Wise Men of the panel until curfew was sounded.

A little humor was injected in some of the answers as well as in some of the drawings and diagrams in the form of Surrealist art, which helped this sometimes over-serious group to be more relaxed and less formal in partaking of their feast of knowledge.

This type of educational course proved to have many other advantages; it helped to uncover sources of talent and knowledge heretofore unrevealed in some of the more modest members.

A total of 124 registered, some of whom voiced the opinion that it was the most instructive and informative course ever given by an A.S.M. chapter.

Many inquiries have come in from other chapters, and if interest keeps up, it is suggested that Boston might copyright this course and start out a road company in the fall.

Misapplications Of Steel Pointed Out by Frye

Designer of Modern Equipment Must Cooperate With Metallurgist and Purchasing Agent

York Chapter—In spite of its antiquity, steel, as we know it, is really a new and modern product, said John H. Frye, metallurgical engineer, Columbia Steel & Shafting Co., Pittsburgh, addressing the Chapter on Feb. 9.

Along with the tremendous improvement and development of steel during the past decade, there has been a simultaneous evolution in engineering design. Today streamlined equipment lighter in weight and requiring less floor space than formerly must operate at greater speeds and greater loads.

To accomplish this and to take advantage of the hundreds of grades of steel available, each with definitely outstanding characteristics, the designer must seek the cooperation of the metallurgist and the purchasing agent.

Ease of Fabrication Too Often Sought

Mr. Frye stated that in his experience the most common, as well as most costly, misapplication is the use of some grade solely because it is easier to fabricate, with no thought to the requirements of service or cost of failure.

A somewhat common error is the use of medium carbon or alloy steels, because of their greater potential strength, to effect reduction in cross-sectional area and weight without consideration of bending or fatigue stresses. Bending is entirely, and fatigue resistance greatly dependent upon cross-sectional area, with analysis an irrelevant factor. A large percentage of fatigue failures are due to reduced area, while an even greater percentage are caused by faulty design or machining practices.

The speaker mentioned the importance of leaded bessemer and open-hearth steels, pointing out that faster cutting speeds and heavier feeds can be used with the proper equipment. However, the majority of automatic screw machines in use are not capable of developing sufficient speed to obtain the potential machinability of high sulphur bessemer screw steel. Consequently, unless the equipment is of modern type, there can be little advantage in using this more costly type of steel.

Leaded Alloy Steels Undeveloped

Greater enthusiasm was shown toward the use of leaded open-hearth grades. Leaded alloy steels are only in the experimental stage. (Recent developments indicate that they will not be commercially produced, at least for the present.)

There was an interesting discussion on the use of yield strength rather than tensile in engineering calculations.

A questionnaire sent to a number of structural engineers showed an overwhelming percentage in favor of using the yield value, while the majority of engineers designing machine tools or other equipment have already adopted this value.

Cold worked metals have received little attention as engineering materials, being generally thought of as machining types of steel, used for size accuracy and surface finish. They are also a high strength material that is easily and economically fabricated with a wide range of physical properties.

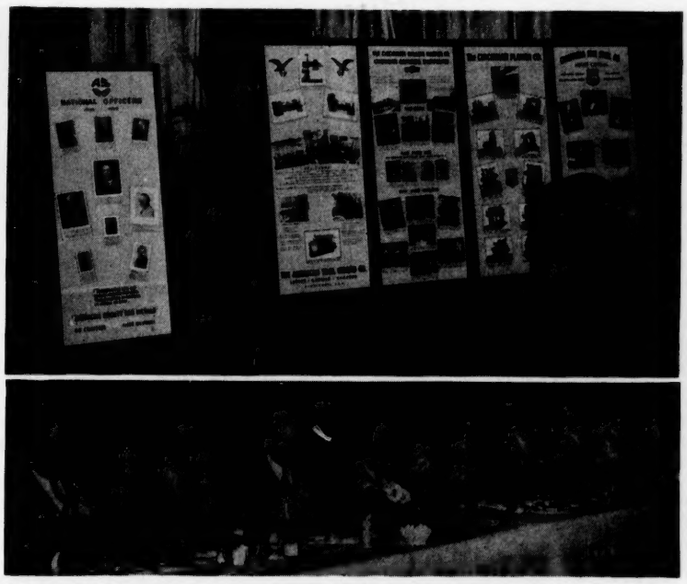
In many quarters the opinion still exists that cold drawn bars have a work-hardened shell or skin. In reality, the effect of the cold working penetrates uniformly and completely. The mechanical properties of the steel will be more uniform from circumference to center than they were in the hot-rolled bar from which it was drawn, irrespective of the bar size.

Another fallacy is the so-called brittleness of cold drawn bars. On the basis of equal yield strength they have essentially the same elongation and reduction values as bars processed by heat treatment.

In closing Mr. Frye again emphasized the importance of cooperation in designing and in the proper selection of steel, stating that one of the greatest wastes in industry is the misapplication of steel. Proper application can only be made through the complete collaboration of the designer, the metallurgist, the purchasing agent and the source of supply.

The talk was followed by a discussion on selection and processing for certain applications.

Display Panels and Speakers' Table



Top: Part of the Exhibition of Photographic Display Panels Sponsored by Cincinnati Sustaining Members at the Tri-Chapter Meeting.
Bottom: At the Speakers' Table, Left to Right, Are C. E. Monnier, Vice-Chairman, Dayton Chapter; Erle Ross, Engineering Editor of Steel; G. H. Cole, Dayton Chairman; R. E. Christin, Secretary, Columbus Chapter; J. B. Caine, Vice-Chairman, Cincinnati Chapter; W. H. Eisenman, National Secretary A. S. M.; H. K. Ihrig, One of the Speakers; Kurt Siems, Cincinnati Chairman; R. L. Lerch, a Speaker; and George H. Gerdes, Cincinnati Secretary.

Manufacture of Cemented Hard Alloys Discussed

By James Patterson

Los Angeles Chapter—The March meeting was a joint gathering with the Los Angeles Chapters of the American Welding Society and the American Society of Mechanical Engineers held at the Los Angeles Athletic Club on March 9.

The speaker of the evening was Philip McKenna of McKenna Metals Co., Latrobe, Pa., who spoke on "Crystalline Inter-Metallic Compounds in Cemented Hard Alloys".

Mr. McKenna discussed in great detail the difficulties encountered in the manufacture of the various cemented hard alloys used for carbide machine tools. His company has spared no expense in this great development.

This talk was accompanied by slides illustrating various applications in which carbide tools have proved efficient.

After the talk many practical questions were asked Mr. McKenna, who, through his wide experience with carbide tools, was well qualified to answer intelligently.

Mayari Steel Has High Strength, Good Corrosion Resistance

By H. D. McCarty

Baltimore Chapter was addressed at the meeting held on April 17 by J. L. Gregg of the Bethlehem Steel Co., on the topic of the new Mayari-R steel.

This material, which has been in use since 1934, has the following chemical analysis: Carbon 0.12% max., manganese 0.50 to 1.00%, phosphorus 0.08 to 0.12%, sulphur 0.05% max., silicon 0.05 to 0.50%, chromium 0.20 to 1.00%, nickel 0.25 to 0.75%, copper 0.50 to 0.70%.

It can be readily seen that the increased manganese and phosphorus in this new steel should give an increase in the yield point and the tensile strength. Thus Mayari develops a yield point of 50,000 psi. and a tensile of 70,000 psi. This is almost double that of soft or low carbon steels. The modulus of elasticity is the same.

By using Mayari the weight of the various structures can be cut in half. The cost is about 50% higher, but is compensated by the decreased weight.

Corrosion resistance has to be better, for the section thickness is cut in half on most jobs. This property has proven higher than in low carbon or copper-bearing steels, both in the atmosphere, under tap water and under sea water in tests made at the Bethlehem plants.

The steel can be fabricated into almost anything reasonable for transportation use in the average shape. It can be welded because of the low carbon content without producing any hardenability.

Its high phosphorus gives plenty of toughness. Impact and notch tests proved this, and at the same time did not show any signs of a brittle steel.

Longer life and reduced weight are Mayari's two big points and thus we see it creeping into railroad cars, mining cars, trailers and any means of transportation where lightness is required with corrosion resistance.

Unusual Events DistinguishOhio Group Meeting

Sustaining Members Sponsor Displays at Annual Tri-Chapter Meeting in Cincinnati

By Kurt Siems

Cincinnati Chapter this year again took its turn in entertaining the Dayton and Columbus Chapters at the annual Southern Ohio Tri-Chapter Meeting on April 20.

Special preparations had been made to make this meeting interesting and educational and to dress it up differently from other similar meetings in the past. What did we do?

First, a general subject was selected —"Unusual surface hardening".

Second, three technical talks were scheduled only, each one pertaining to one specific method of surface hardening.

Third, a lecture was inserted in the middle of the afternoon on a topic entirely foreign to anything in connection with either the manufacture or treatment of metals.

Mayor Gives Luncheon Talk

Other features were a sound motion picture entitled "History of American Baseball" made by the National League, and an inspiring talk after the noon luncheon by Mayor James Garfield Stewart of Cincinnati.

The most important innovation, however, was an exhibition of photograph display panels sponsored by the 25 sustaining member companies of the Cincinnati Chapter—proof of the close cooperation that exists between these companies and the Chapter.

Speakers for the three technical lectures were Stephen Smith of the Air Reduction Sales Co., who discussed "Flame Hardening"; R. L. Lerch of the Haynes Stellite Co., who spoke on "Hard Facing Alloys and Their Application"; and Harry K. Ihrig of the Globe Steel Tubes Co., who lectured on "Silicon Impregnation".

Non-Technical Lecture Is Popular

The non-technical lecture in the afternoon was "Minds I Have Met" by Dr. Harry Granson Hill, head of the Cincinnati Life Adjustment Clinic and leader of New-Thought Temple. This talk was a decided innovation and repeated demands to the chairman to "get off the schedule" in order to have him prolong his speech were ample proof of its complete success.

The schedule as a whole had been arranged so that ample time for relaxation between lectures was available to study the display panels, renew old acquaintances and enjoy four bushels of nice juicy apples.

Door prizes and souvenirs donated by numerous interested firms were plentiful.

Total registered attendance for the day was in the neighborhood of 250.

Eisenman Gives Two Talks

A.S.M. National Secretary W. H. Eisenman recently gave two talks on his specialties of engineering society administration and exhibit management.

"How the Exhibit Manager Looks at Exhibits" was the title of his talk presented before the Association of National Advertisers on May 11 in Rye, N. Y. Mr. Eisenman is president of the Association of Exhibit Managers.

During the American Gas Association Conference on Industrial Gas Sales held in Cleveland March 27 and 28, he presented an address on "Getting the Most From Outside Sales Aids".

Minutes of the Board Meeting

Present at the meeting of the Board of Trustees of the A. S. M. held on April 7, 1939 at Cleveland, were W. P. Woodside, president; J. P. Gill, vice-president; Bradley Stoughton, treasurer; W. H. Eisenman, secretary; and Trustees G. B. Waterhouse, H. A. Anderson, D. S. Clark, F. B. Foley, and S. L. Hoyt.

Treasurer Stoughton presented the report of the meeting of the Finance Committee held on April 6.

The recommendation of the Finance Committee that the financial statements to the membership and to the Board of Trustees should contain an item showing the total monies accumulated from the investment account since the inception of the fund, was approved.

The Board of Trustees examined the list of securities of the Society inasmuch as it was desirable to dispose of items to secure cash to reimburse the commercial account for the payment ($45,000) for the new headquarters of the Society.

It was felt that, since the sale of Governments would show a spendid profit of approximately $5,000 and since the general bond trend indicates that the Governments have probably reached top sale price, it was advisable to secure cash funds from this source. Upon motion unanimously carried, it was decided to sell $15,000 Home Owners Loan Corp. 3's, 1952; $30,000 U. S. Treasury 3⅛'s, 1949; $9,000 U. S. Treasury 3⅜'s, 1943.

It was agreed that the money should be placed in the investment fund and used by the Society as necessary in order to replace funds already expended by the Society in payment of full purchase price of the A. S. M. home.

The entire report of the Treasurer and the Finance Committee was approved.

Convention Program Outlined

Assistant Secretary Bayless presented a list of the papers promised for the National Metal Congress and an outline of the symposium to be presented during the Congress, and the afternoon and evening educational lecture series, all of which gave an indication that the program would maintain a very high standard.

Mr. Hoyt presented his thoughts as to the desirability of having available for the members of the Society the discussions (written and oral) of the preprinted papers presented at the annual congress so that those interested might have the opportunity of having the discussions greatly in advance of the time when they appear in the TRANSACTIONS.

The Board of Trustees recognized the merit of Mr. Hoyt's suggestion, and it was agreed that the discussions to preprinted papers presented at the annual convention should be combined and made available in pamphlet form to members, free on request, as soon after the Congress as possible.

The Secretary presented a verbal report on the progress of the National Metal Exposition, indicating that the reservations were quite satisfactory, that a little over 70,000 sq.ft. of space had been reserved on the date of the meeting and that all indications pointed to another sell-out.

Desvernine Is Banquet Speaker

President Woodside announced that Mr. R. E. Desvernine, president of the Crucible Steel Co. of America, had accepted an invitation to be the principal speaker and one of the guests of honor at the annual banquet of the Society to be held at the Palmer House on Thursday evening, Oct. 26.

The Secretary then presented the board with copies of the new edition of the Metals Handbook and also with all of the issues of the Handbook that had been published by the Society, from which the board was able to note the improvement, progress and enlargement during the life of the book.

Upon motion properly made, seconded and unanimously carried, it was determined that the word "undergraduate" should be eliminated from the present junior application and that the wording of the constitution of the Society should be printed thereon.

It was also moved, seconded and unanimously carried that three years would be the maximum length of time that a postgraduate student should enjoy the privileges of junior membership in the A. S. M. and that in order to be able to classify as a junior member the candidate should present a certificate signed by the registrar and the head of the department that his principal occupation in residence at the university is that of a student.

Membership to Be Clarified

It was determined to refer to the Constitution and By-Laws Committee for their consideration a revision or an explanatory expansion of the provisions in the constitution dealing with founder and honorary memberships.

Upon motion unanimously carried, the Secretary was authorized to investigate further the proposal of employment service as contained in the letter from the Technical Placement Service and also to continue his investigations with reference to the possibility of cooperation with the employment service of the founder societies, and to complete details if found satisfactory.

Considerable correspondence was then presented to the Board of Trustees from Stuart M. Clarkson, vice-president of the Industrial Furnace Manufacturers' Association, 420 Lexington Ave., New York City.

As requested, a committee was appointed to meet with a similar committee of the American Iron & Steel Institute and the I. F. M. A. The membership of this committee is to be Trustee F. B. Foley, Midvale Co., chairman; John Wyzalek, Hyatt Bearings Div., General Motors Corp.; and A. J. Phillips, American Smelting & Refining Co.

Upon motion properly made, seconded and unanimously carried, the meeting adjourned.

Speaker and Officers Give "Feast of Good Things"

By J. W. McBean

Ontario Chapter had a feast of good things at the meeting on March 31—in addition to the guest speaker, National President Woodside and National Secretary Eisenman were present.

Mr. Eisenman opened the program with a brief chat in his usual happy vein, and gave some information about the new Handbook.

Mr. Woodside then gave a sound movie film "A Panorama of Alloy in Steel", which tied in very appropriately with the topic of the evening.

This was a paper on "Specific Effects of Alloy Additions in Steel Making" by A. B. Kinzel, chief metallurgist, Union Carbide and Carbon Research Laboratories, Inc., New York.

With no tools but a piece of chalk, Dr. Kinzel was able to give a remarkably clear picture of the effect of the various elements on the properties of a steel. His talk has been reviewed in a previous issue.

A barrage of questions was thrown at the speaker, but in spite of this and the triple bill, the meeting wound up in good time.

Boston Chapter Has Aircraft Meeting

At the Speakers' Table Are Miss Lillian Fletcher, Coffee Speaker; E. N. Downing, Chapter Chairman; H. J. Fischbeck, Technical Speaker; R. F. Harrington, Chairman, Program Committee; George B. Waterhouse, Past National President; Howard Handy, Chapter Secretary; and George Burnett, Chairman Educational Committee (Photo by Arden L. Knight).

Detroit Plays Host to A. S. M. Presidents And Pioneer Editor

By Walter G. Patton

Detroit Chapter—Despite the fact that old Jupiter Pluvius, rainmaker extraordinary, was in a particularly uncooperative mood, more than 250 members put on their hip boots and made their way to the Fort Shelby on the night of April 10 to honor their fellow member and National President, William P. Woodside, and National Secretary Bill Eisenman, as well as listen to the authoritative words of A. H. d'Arcambal of Pratt & Whitney Co. on the subject of "Tool Steels".

When it is remembered that on this memorable occasion the Detroit Chapter was simultaneously playing host to President Woodside, Past Presidents A. H. d'Arcambal and J. M. Watson, and the first editor of the predecessor to TRANSACTIONS, C. Newman Dawe, one can easily forgive the pardonable pride the Detroit officers take in having arranged such a successful meeting.

Bill Eisenman was in rare form. Perhaps the fact that he could aim his shots at either his traveling companion and pal, Bill Woodside, or another equally broad-shouldered gentleman by the name of d'Arcambal made the stories all the more uproarious.

Responding to an unusually touching tribute by Bill Eisenman, National President W. P. Woodside expressed his deep gratitude to his fellow members and then proceeded to prove that Bill Eisenman's diary of their recent trip is at least as vulnerable as Bill Woodside's intimate and confidential notes covering the same sojourn.

d'Arc Makes Good on Promise

Judging from reports that have reached us, one pressing question about tool steel left unanswered by "d'Arc" was whether the speaker was superior as a prophet or an authority on his subject. In presenting his topic, d'Arcambal warned his audience that they must listen closely "since every damn word was important". What's more, he made good on his promise.

Talking earnestly, without notes or the assistance (or impedance) of a microphone, d'Arc literally invited his audience into his living room, hung his foot in familiar fashion over a chair, and simply let his extensive knowledge of his subject come out. The result was a generous education in tool steel, adequately reviewed in previous issues of this paper.

The usual heckler's session followed with the hecklers strangely hesitant despite the speaker's earnest invitation to take on all comers.

Perhaps the best advice for the reader is this: "Don't miss d'Arcambal when he plays your town."

By A. J. McDuff

Boston Chapter—A record crowd attended the meeting on March 3, and heard Henry J. Fischbeck, chief metallurgist of the Pratt and Whitney Aircraft Division of United Aircraft Corp., discuss "Metallurgical Problems in the Construction of Aircraft Engines".

Very interesting slides were shown of old and new airplanes, and the engines in them were described from a metallurgical point of view. Motion pictures in color, as well as in black and white, demonstrated a cutaway engine in operation.

Details of Mr. Fischbeck's talk have already been reported.

Miss Lillian Fletcher, an American Airline stewardess, told of her experiences as a coffee talk. The qualifications for such a position are rather strict, but to those qualified the work is very interesting. Serving the public is no sinecure.

(Rumor has it that the number of round trip passengers between Boston and Newark increased tremendously since March 3.)

Harder's Bird's-Eye View Covers 7 Years

By L. F. Herron

Cleveland Chapter—After an introduction of the Chapter's Sustaining Members by Chairman Brown, officers for the 1939-40 season were elected at the meeting on April 3.

O. E. Harder, assistant director of Battelle Memorial Institute, then presented "A Bird's Eye View of Metallurgy", particularly stressing the advances in the seven years since he last addressed the Cleveland Chapter on this subject.

He first took up advances in dental alloys, pointing out the great increase in strength of compacted foil when a platinum-centered rather than a pure gold foil is used.

Improvements in bearings were explained, and the possibilities of silver with perhaps small quantities of lead were presented.

Dr. Harder then took up the field of alloys for high temperature service and showed numerous charts and slides on resistance to oxidation and creep of automotive valve compositions.

Sucker rods, high strength, low alloy structural steels, and the leaded steels were then exposed in turn, and the use of molybdenum to avoid pitting, and columbium and titanium to avert intergranular corrosion of stainless.

The development of the resistors, Kanthal and Smith No. 10, was touched on, and following the mention of grain size and hardenability control, and the advances in the production of pure metals, Dr. Harder was subjected to a barrage of questions which showed how stimulating his talk had been.

How to Weld Non-Ferrous Metals Is Told

Successful Welds Can Be Made if Certain Characteristics of the Metals Are Observed

By J. L. Spence

Montreal Chapter — At the April 3rd meeting a very comprehensive paper entitled "Welding Non-Ferrous Metals by Electric Arc and Gas" was given by Warren R. Coulter of the Coulter Copper and Brass Co., Ltd.

Aluminum, having a melting point of 1200° F., offers a prime difficulty in welding in that it is difficult to tell when it has reached the proper temperature for fusion. Oxide of very much higher melting point than the aluminum forms on the surface and must be removed by flux.

Pure aluminum and most alloys are hot short. The coefficient of thermal expansion is approximately twice that of mild steel and the thermal conductivity is relatively high. Consequently the shorter the welding time, the better the properties of the finished weld and adjacent base metal.

In welding aluminum by the oxy-acetylene method, the flame should be neutral or slightly on the carbonizing side; it is very important that a flux be used to remove the heavy oxide.

Metallic arc welding of aluminum has the advantage of producing less buckling along the weld and less annealing of the base metal adjacent to the weld. Carbon arc welding is adaptable to some needs.

Short Welding Time Advisable

In welding Monel, nickel and Inconel, the characteristics of the metal must be carefully considered. As with all other non-ferrous metals, the shorter the time to complete the weld, the better the quality of the metal in the weld and adjacent to the weld.

Oxy-acetylene welding of Monel and nickel requires a neutral flame but it is best to use a slightly carbonizing flame. Flux is used with Monel but seldom with nickel.

In arc welding Monel or nickel, reversed polarity, using heavily fluxed electrodes, with the core wire containing small traces of aluminum for Monel, and titanium and magnesium for nickel, is recommended to reduce porosity in the weld.

Carbon arc welding of Monel and nickel is frequently undertaken for sheet in the intermediate range of gages of 0.037 to 0.050 in., and sometimes heavier.

Inconel is readily weldable by practically the same procedure except that a suitable flux has to be provided to protect the chromium from oxidation.

Neutral Flame for Copper

In welding copper by the oxy-acetylene method, the flame should be as neutral as possible with the flux mixed into a paste and brushed onto the filler rod and the base metal. Best results have been obtained using a deoxidized copper rather than electrolytic for the welding rod.

The electric arc welding of copper has not been very successful because of copper's affinity for gases when in the molten condition. However, the carbon arc welding of copper, using a very long arc and a phosphorus bronze rod, has produced very good welds in both deoxidized and electrolytic or commercial copper.

The copper-silicon alloys have a melting point somewhat lower than copper; oxygen unites with the silicon to form a glassy film which floats on the molten metal and protects it from the air; the ductility is fairly good except just below the melting point.

In summary, the welding of most of the non-ferrous metals involves no great problem. It is essential that weldability characteristics of the metal be carefully studied so that the correct technique can be followed. In general, non-ferrous metals are weakened by oxidation when welded, but successful welds can always be produced if the peculiarities of the metal are considered and taken into account.

The coffee talk took the form of sound motion pictures entitled "The Making of Stainless Steels", by courtesy of the Republic Steel Corp.

Diamond Chain Co. Visited

By D. B. Nelsen

Indianapolis Chapter held a highly successful meeting on March 20.

At 4:30 p. m. approximately 150 members and guests met at the entrance of the Diamond Chain & Mfg. Co. and were shown through the plant. This was a most interesting tour of inspection and was enjoyed by all.

Immediately following the tour, dinner was served at the Washington Hotel; approximately 85 attended. A talk was given by Arthur E. Focke, research metallurgist, Diamond Chain & Mfg. Co., on "Dynamic Properties of Metals".

HERE AND THERE WITH A.S.M. MEMBERS

TED BARKER, founder member of the Society and until recently president of Accurate Steel Treating Co., has now become "my host" and is proprietor of the Atascadero Motor Lodges at Atascadero, Calif.

T. E. Barker

Ted guarantees that the sheets will be clean and that each lodge is equipped with pyrometer equipment to assist in making the inside as comfortable on a hot night as a winter lodge at Lake Arrowhead.

Mr. Barker wants to call attention to the fact that all of his friends should stop there (and pay the regular rates).

Ted reports he is feeling fine and that the only thing needed to make anyone feel fine is the privilege of living in California where they have only two kinds of fogs, the high fog and the low fog, the difference being that the low fogs take out the bridges.

* * *

PHILADELPHIA Chapter Secretary FRANKLIN H. PENNELL, formerly with the Autocar Co., is now metallurgist in the sales division of Wyckoff Drawn Steel Co., Philadelphia office.

* * *

ALFRED W. SIKES, past chairman of the Chicago Chapter, A.S.M. has recently been elected to the executive committee of the chemical and metallurgical section of the Western Society of Engineers.

A. W. Sikes

Mr. Sykes is a graduate of the University of Illinois and the Carnegie Institute of Technology, where he was a research fellow in metallurgy. He is now senior engineer, P.W.A., Chicago.

In addition, Mr. Sikes has for several years conducted courses in metallurgical engineering at Lewis Institute evening school.

FOR the first time the E. J. Fox Medal of the Institute of British Foundrymen will be awarded to someone outside of Great Britain. Recipient, "for his contribution to the manufacture of malleable castings", will be HARRY A. SCHWARTZ, manager of research, National Malleable & Steel Castings Co., Cleveland.

Educated at Rose Polytechnic Institute in Indiana, Dr. Schwartz has been with National Malleable since 1902—at the Indianapolis Works until 1920 and since then manager of research in Cleveland. He also acts as professorial lecturer in metallurgy at Case School of Applied Science.

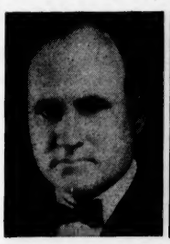
* * *

ELECTION of ZAY JEFFRIES, past president A.S.M., to the National Academy of Sciences—the highest scientific honor conferred in America—was announced recently at a luncheon held in his honor at the Union Club in Cleveland. Dr. Jeffries' distinguished service in the development of cemented tungsten carbide was the basis for his admission to the Academy.

Dr. Jeffries left teaching at Case School of Applied Science to join the National Lamp Works (now Incandescent Lamp Department) of General Electric Co. in 1914. He is now consultant for this department and chairman of the Carboloy Co. For many years he was also consulting metallurgical engineer for Aluminum Co. of America.

Among his many honors was the award of the Sauveur Achievement Medal of the A.S.M. in 1935.

Two Clevelanders Honored



Zay Jeffries

H. A. Schwartz

* * *

TIM HOLDEN, who has been secretary of New York Chapter for 19 years, and BILL PRINTZ, a charter member of the Society who has always been connected with temperature control companies, are now in business together as Holden-Printz Co., 25 W. 34th St., New York City. They are representing Riehle Testing Machine Division, Despatch Oven Co., A. F. Holden Co. and H-B Instrument Co., and are also handling a general line of pyrometers and furnaces.

* * *

HARRY J. SWEENEY, metallurgist, Republic Steel Corp., Youngstown, Ohio, and retiring chairman of the Mahoning Valley Chapter, has recently returned from an eight-week visit to England, Scotland and Germany, where he studied open-hearth steel making practices.

* * *

AFTER 20 years with Chrysler Corp. and its predecessor, Maxwell Motor Co., B. B. BECKWITH, secretary of the Detroit Chapter, has joined the metallurgical staff of the Vanadium Corp. of America.

B. B. Beckwith

Beckwith graduated from Syracuse University with a B.S. in Chemical Engineering in 1918 and worked for a short time for Halcomb Steel Co. in Syracuse and Aetna Chemical Co. in Pittsburgh before joining Maxwell Motor in 1919.

In his new connection with Vanadium, his headquarters will remain in Detroit but he will spend part of his time in Chicago.

Souvenir Radiograph Made at York Meet

By A. Floyd Whalen

York Chapter—The annual Harrisburg meeting was held at the Colonial Country Club on April 13, and to do it justice would require the aid of Bill Eisenman's famous collection of superlatives.

Suffice it to say that Honorable I. Lamont Hughes, secretary of highways for the Commonwealth of Pennsylvania and former president of the Carnegie Steel Corp., combined a coffee talk with a state-wide broadcast over seven stations.

He gave a talk on the need of applying business efficiency in government enterprises. He drew his illustrations from past experiences that failed to conform with modern business practices.

About 115 heard D. W. Briggs, technical adviser to the American Steel Founders Association of America, speak on "Radiography".

Before he spoke the subject was only a name to most present but when he had finished X-rays and gamma rays were such close friends that all who were present felt they could take them home in their coat pockets.

He was assisted in his talk by Jack Cotton, who made three gamma ray radiographs of castings, welds and a souvenir casting taken behind a steel plate and bearing the message: "York Chapter A.S.M., Harrisburg, April 13, 1939".

York officials took home both the casting and the radiograph and have one more memory to tie them to the city on the Susquehanna. The radium used was furnished through the courtesy of the Radium Chemical Co., Inc., of New York.

Dr. Briggs not only gave a marvelous talk but he greatly endeared himself to the Chapter by canceling a previous engagement and pinch-hitting on two days' notice, substituting for G. E. Doan of Lehigh University who was unfortunately stricken with influenza three days before the meeting.

Students Are Guests at Chicago to Hear Van Horn

By Arnold L. Rustay

Chicago Chapter — Member Adam Steever's deftly prepared color motion picture on "Tool Steel" delighted the students' night audience at the Chicago April dinner meeting.

Honor students from nearby colleges were guests of the Chapter as the program committee presented principal speaker Dr. Kent R. Van Horn and his never dull "Age Hardening".

Dr. Van Horn postulated that age hardening systems require an element or compound that has an increasing solubility with increasing temperature of the base metal. A condition of supersaturation in the alloy must exist, followed by particle precipitation or incipient particle precipitation if the alloy is to be age hardened.

The characteristics of solid solutions of the partial solubility in solid state type were outlined as a preface to his presentation of the slip interference theory of precipitation hardening.

Applications of age hardening alloys were shown.

Helpful Literature — Mail Coupon Below

Bristol Potentiometers—All of the Pyromaster Round-Chart Potentiometers manufactured by the Bristol Company are described in a new bulletin which explains the simple operating characteristics of Bristol's Pyromaster. Nb-87.

Aluminum Finishes—Good printing, good paper, spiral binding and an attractive presentation add interest to the valuable technical information on "Finishes for Aluminum" contained in Aluminum Co. of America s new booklet. Bulletin Oy-54.

Heat Resisting Alloys—Authoritative information on alloy castings, especially the chromium-nickel and straight chromium alloys manufactured by General Alloys Co. to resist corrosion and high temperatures. Bulletin D-17.

Columbium—"Advantages of Columbium in Wrought 4 to 6 Per Cent Chromium Steel" is the title of a booklet which gives detailed test data to prove its advantages. Electro Metallurgical Co. Bulletin Cc-16.

Annealing and Hardening—Annealing and Hardening with SC atmosphere furnaces is dealt with in a new folder by the Surface Combustion Corp. Bulletin Cc-51.

Tocco Process—This amazing and extremely accurate method of heat treating is described in a four-page leaflet, yours for the asking. Distributed by Ohio Crankshaft Co. Oy-145.

Furnace Experience—Facts developed through 32 years of engineering and building practically every type of industrial fuel equipment can be obtained through Flinn & Dreffein Co. Bc-82.

Vacuum Cleaning—A very colorful brochure which illustrates modern cleaning methods by, vacuum in industrial plants has just been released by The Spencer Turbine Co. Dc-70.

Testing with Monotron—Shore Instrument & Mfg. Co. offers a bulletin on Monotron hardness testing machines which function quickly and accurately under all conditions of practice. Je-33

Molybdic Oxid—A new product just placed on the market by the Climax Molybdenum Co., Molybdenum Oxide Briquettes, are described in a pamphlet released recently. Bulletin Ec-4.

Salt Bath Furnace—A colorful 12-page illustrated booklet describing the new Ajax Hultgren Electric Salt Bath Furnace has been released by the Ajax Electric Co. Bulletin Ec-43.

Copper Alloys—A helpful booklet showing copper and copper alloy sheets, wire, rods, tubes and special shapes is available through the American Brass Co. Bulletin Ec-89.

Alloy Castings—Calite chromium-nickel alloy castings for furnace roller rails are pictured and described in a release by the Calorizing Co. Bulletin Ec-26.

Drop Hammers—Steam drop hammers described in detail in a valuable booklet just published by the Chambersburg Engineering Co. Bulletin Ec-132.

Electric Furnaces—"Certain Curtain" electric furnaces for heat treating all types of tool steel —1200 to 2500° F.—are shown in a bulletin by C. I. Hayes, Inc. Bulletin Ec-15.

Metal Powders—An attractive booklet containing analyses of metal powders and screen sizes is published by Metals Disintegrating Co. Bulletin Ec-208a.

Plastic Testing—Modern plastic material testing machines have been completed by Tinius Olsen Testing Machine Co. and are described in a colorful booklet just released. Bulletin Ec-147.

Heat Treating Furnaces—A brand new 16-page booklet of Holcroft & Company shows and describes their line of controlled atmosphere heat treating furnaces. Bulletin Ec-203.

Handy Tool—That the "tool of 1001 uses" is rightly named will be admitted by anyone who looks over Chicago Wheel and Manufacturing Co.'s 63-page catalog on the "Handee". See how you can use it in your business. Ec-230.

Laboratory Service—A new edition of "The Metal Analyst" tells about an organization established by Adolph L. Buehler specializing in the installation of metallurgical laboratories. The complete line of laboratory equipment marketed by Buehler is also catalogued. Dy-135.

Pyrometer—A recording controlling pyrometer which makes possible the operation of control and signals and other phases of regulation in one instrument is described in a booklet by the Foxboro Co. Bulletin Ec-21.

Alloy Die Castings—An interesting booklet showing alloy castings of many forms has just been made available through the New Jersey Zinc Co. Bulletin Ec-228.

Complete Pyrometer Unit—Bulletins describing complete pyrometer units with accessories for one initial cost have been released by the Lewis Engineering Co. Bulletin Ec-227.

Industrial Furnaces—Furnaces of all types are fully described in technical bulletins made available by the Eclipse Fuel Engineering Co. Bulletin Ec-226.

Cutting Oils—An interesting new booklet "Metal Cutting Lubrication—In Theory and Practice" has just been made available by Cities Service Oil Co. Bulletin Ec-113.

Steel Publication—A deluxe magazine "Steel Horizons" dealing with new developments in steels is available through the Allegheny-Ludlum Steel Corp. Bulletin Ec-92.

Instruments—A new general catalog including machine tools, instruments and machinery made by George Scherr Co. contains several items being shown in the U.S. for the first time. Bulletin Ec-206.

Microscopes—Ultropak Microscopes, for examination of opaque objects by indirect light, are completely described in a new booklet published by E. Leitz, Inc. Bulletin Ec-47.

Dehumidifier—Lectrodryer systems, employing activated alumina for drying air and gases by absorption, are described in an attractively illustrated booklet by the Pittsburgh Lectrodryer Corp., Pittsburgh. Bulletin Bb-187.

Bimetal—Interesting facts about thermostatic bimetal are contained in an extremely well-prepared book by W. M. Chace Valve Co. Applications, forms available, and how the material acts in temperature control devices are given. Bulletin Ec-232.

Duraloy—Duraloy chrome-iron, chrome-nickel and nickel-chrome alloys for resisting temperature, corrosion and abrasion are described in an illustrated pamphlet by the Duraloy Co. A handy table compares the properties and characteristics of the various types. Bulletin Ec-233.

Crucible Melting—Accuracy of furnace construction for brass melting will develop the minimum in operating cost, R-S Products Corp. maintains in presenting the features of construction and operation embodied in the R-S tilting and stationary crucible brass melting furnaces. Bulletin Ec-234.

Strenes Metal—A colorful folder gives the story of Strenes Metal, a new and unique material that is a chromium-nickel-molybdenum alloy with a high steel base, used primarily for cast-to-shape forming and drawing dies. Ec-231.

Die Steels—High carbon, high chromium die steels are discussed in a booklet released by Crucible Steel Co. Bulletin Ec-56.

Cutting Components—Of special interest in the new booklet distributed by E. F. Houghton & Co. is an article detailing the function of sulphur in a cutting oil. Bulletin Ec-38.

High Temperature Combustion Furnaces—Single and double tube laboratory furnaces, provided with Globar elements producing temperatures up to 2500° F., are described in a bulletin of Burrell Technical Supply Co. Bulletin Ec-213.

X-Ray Diffraction—A new high-precision unit for X-Ray diffraction is described in a booklet issued by General Electric X-Ray Corp. Ec-6.

Welding Accessories—A full line of arc welding accessories is shown and described in a booklet released by the General Electric Co. Bulletin Ec-60.

Brazing Furnace—If you have a brazing problem you will be interested in the worthwhile folder issued by Hoskins Mfg. Co. Ec-24.

Burners for Industrial Furnaces—This illustrated, 4-page folder is devoted to the new Duradiant burner whose outstanding feature is a refractory burner tip. Chamber temperatures from 3000 to 2400° F. can be produced. Selas Company. Bulletin Ec-214.

Gases for Bright Annealing—Bulletin gives details concerning the Industrial Carburetor, heart of the Atmos-Gas producer, shows types of installations and gives useful tables. C. M. Kemp Mfg. Co. Bulletin Ec-219.

Arc Welders—The three types of Marquette a.c. arc welders, in ranges up to 250 amps., are illustrated and described in this folder. The machines feature streamlined design and 15 taps on the front panel which provide a wide choice of welding amperage. Marquette Mfg. Co., Inc., Minneapolis. Bulletin Ec-216.

Tensile Tester—A new tensile testing machine for wire, sheet metal and other small-size samples is described in a new bulletin. The machine is claimed to be simple, rugged and unusually accurate; an automatic recorder plots stress vs. strain and permits quick determination of yield points, total elongation, etc. Henry L. Scott Co. Bulletin Ec-217.

Super Refractories—A catalog of Chas. Taylor Sons Co. is replete with useful data on P. B. Sillimanite refractories for use up to 3300° F. in electric furnace roofs and linings, induction furnaces, crucible furnaces, fuel-fired hearths, piers and linings, burner blocks, etc. Ec-218.

Dowmetal Data Book—A new edition, containing especially significant accomplishments in the sections on "Available Forms" and "Shop Practice" has been published by Dow Chemical Co., Dowmetal Div. Bulletin Ec-215.

Rust Preventative—A rust preventative which succeeds when others fail is described in literature made available by the Simoniz Co. Cc-94.

New Copper Alloy—Mallory 333 metal, a new copper-chromium-lithium alloy, described as combining hardness with high conductivity, is useful for welding electrodes and other applications, according to a bulletin of P. R. Mallory & Co. Bulletin Ec-220.

Testing and Controls—An up-to-the-minute booklet on foundry sand testing and control equipment is just off the press. Published by Harry W. Dietert Co. Bulletin Ec-198.

Welding Contactor—The Weld-O-Trol, a Westinghouse ignitron a-c welding contactor without timing, is described in a new leaflet released by Westinghouse Electric & Mfg. Co. Ec-134.

Industrial Compressors—Small industrial compressors and vacuum pumps, from ¼ to 15 h.p., are covered in a bulletin which gives complete rating tables of more than 50 models. Ingersoll-Rand Co. Bulletin Ec-222.

Electric Forging Heaters—Berwick heaters employ the direct electric resistance method to heat the metal, and feature temperature control by photocell. Advantages claimed are speed, uniformity, absence of distortion, and economy. American Car and Foundry Co. Bulletin Ec-223.

High Temperature Insulation—An illustrated leaflet is devoted to types and uses of thermal insulation, for all types of heating equipment. Armstrong Cork Products Co. Bulletin Ec-221.

New High-Strength Steel—This little book gives facts and figures on DYN-EL, a new high strength, flat rolled steel claimed to have unusual resistance to fatigue, impact and corrosion. Complete fabricating and design properties and table of sizes and weights are included. Alan Wood Steel Co. Bulletin Ec-225.

Refining Slag—Purite made by Mathieson Alkali Works is stated to reduce metal shrinkage and casting losses and to improve general quality by forming a protecting and refining slag. Composition, general instructions for use, and directions for use with various furnaces are given in Bulletin Ec-224.

High-Strength Steel Data—Complete mechanical property data on Ductiloy, a new low-alloy, high-strength steel, are given for strip, plate and bars in a folder of Great Lakes Steel Corp. Bulletin Ec-229.

Portable Hardness Tester—The "Telebrineller" is described in a new bulletin as a simple, rugged, flexible instrument that accurately determines Brinell hardness of surfaces and objects inaccessible to conventional testers. Total weight, 6½ lbs. Teleweld, Inc. Bulletin Dc-98.

Valcase—Chapman Valve Co. has a fused salt bath mixture known as Valcase which forms a perfectly balanced and economical carburizing bath. A folder gives instructions for handling and use and typical results obtained. Na-80.

Cleaning Processes—An attractive 12-page booklet entitled "Scientific Metal Cleaning" has been published by Detroit Rex Products Co. It describes in detail the applications and advantages of Detrex degreasing with Perm-A-Clor or Triad Safety Solvents and the applications of Triad Alkali Cleaning Compounds and Strippers. Bulletin Oy-111.

Scale-Free Hardening—Complete information on equipment to assure precise heat treatment, eliminate scale, reduce costs, and improve working conditions is contained in a publication by General Electric Co. on conveyor-type electric furnaces for use with protective atmosphere for scale-free hardening. Bulletin Bb-60.

Non-Ferrous Pyrometer—A pyrometer which can use either "bare" or "protected" thermocouples on non-ferrous metals is described in an interesting folder released by the Pyrometer Instrument Co. Elements are interchangeable within a second and maximum and true temperature indication is reached within a few seconds. Bulletin Cc-37.

Cleaning Rooms—A catalog of designs for blast cleaning rooms incorporating many labor and time saving improvements making the blast room an unequalled mechanical device for low cost cleaning is published by Pangborn Corporation. Bulletin Ca-68.

Corrosive Solutions—A catalog by Duriron Co. covers a complete line of equipment for handling corrosive solutions, with information as to sizes, capacities, dimensions and engineering data for innumerable items. Bulletin Ka-152.

Monel and Nickel—An exhaustive study of Monel Metal and Nickel is contained in a 20-page booklet issued by the International Nickel Co. Well illustrated by pictures of these metals in actual use. Bulletin Eb-45.

Modern Metallograph—Bausch & Lomb research metallographic equipment, which is arousing so much interest and favorable comment in the profession, is the subject of literature recently issued. Bulletin Ba-35.

Calculator—A handy gadget is a sliding weight calculator which can compute weights per lineal inch of steel for 161,200 cross-section. Pocket-size, it contains tables for rounds, hexagons, octagons, squares and flats. Distributed by Heppenstall Co. Bulletin Ea-122.

Model "Y"—The Sentry Model "Y" electric furnace, using the Sentry Diamond Block method of heat treatment provides exceptional quality high speed steel hardening at minimum production cost. Described in Bulletin Oy-114.

Sponge Iron—A Bureau of Mines report gives some interesting data on vibration damping capacity of steels made with Swedish sponge iron as raw material. Ekstrand & Tholand, Inc., has copies for distribution. Bulletin Kb-202.

Correct Alloys—A four-page folder pointing out the importance of correctly designed metallurgical alloys which fit the needs of product and process has been published by the Titanium Alloy Manufacturing Co. Also points out the importance of the spectrograph. Bulletin Db-90.

Ingot Production—"The Ingot Phase of Steel Production" is the title of a book defining the principles of quality ingot production followed by many well-known steel manufacturers. Gathmann Engineering Co. Bulletin Ka-13.

Durodi—Durodi . . . "The practical, serviceable and economical hot work steel" . . . is described in a catalog issued by A. Finkl & Sons Co. Points out uses and characteristics of this alloy. Bulletin Ib-23.

Stressproof—A new Cold Finished Bar is introduced in a colorful booklet released by the LaSalle Steel Company. Well illustrated, the booklet also contains tables showing substantial savings made by the use of this new steel. Bulletin Lb-52.

Colmonoy—The high resistance to wear and corrosion which distinguishes Colmonoy alloys and overlay metals is explained in a 4-page catalog released by Wall-Colmony Corp. Bc-85.

Annealing Atmospheres—An entirely instructive article "Controlled Atmospheres for Copper" has been made available through Continental Industrial Engineers, Inc. Dc-154.

Pure Metals—Pure, carbide-free metals are described and applications suggested in a pamphlet published by Metal & Thermit Corp., who make pure tungsten, chromium and manganese in addition to the ferro-alloys. Ma-64.

Hydryzing—Hydryzed work is completely described in recent literature released by Lindberg Engineering Co. Points out advantages in particular applications. Bulletin Bc-66.

Tool Steel Selector—A wall chart, 30 x 20 in., to be used as a means for selecting the proper type of tool steel is offered by Carpenter Steel Co. to tool steel users in the U.S.A. only. Jx-12.

Heat Treat Chart—Heat treaters everywhere should find a heat treating wall chart complete with S.A.E. specifications a very valuable addition to their shops. Published by Chicago Flexible Shaft Co., manufacturers of Stewart industrial furnaces. Bulletin Ka-49.

Die Steel—Correct treatment for die steel is thoroughly described in literature issued by William Jessop & Sons. Interesting to stamping-die makers, especially. Bulletin Cc-61.

Spring Coiler—Sleeper & Hartley's new segment type spring coiler speaks for itself in a new bulletin. Thirteen points of superiority are carefully explained and illustrated. Complete specifications are given. Bulletin Bc-73.

Bessemer Steel—Jones & Laughlin Steel Corp. has for distribution reprints of the paper by C. C. Henning on "Manufacture and Properties of Bessemer Steel" that received the Robert W. Hunt Award of the A.I.M.E. Bulletin Ca-50.

Electric Tempering—The American Electric Furnace Co., model AO-1, is an ideal unit for tempering individual pieces or production quantities of small parts up to 1200° F. Described in Bulletin Fa-2.

Welding Stainless—How to weld stainless steels is described in a colorful 12-page folder released by the Page Steel and Wire Division of American Chain and Cable Co., Inc. Cc-86.

Ground Shafting—A colorful folder describing Ground Shafting made by Bliss & Laughlin, Inc., is now available through this company. Pictures steps in shafting production. Bc-42.

Ampco Metal—The six grades of Ampco metal, varying in hardness and physical properties but all possessing wear resistance, tensile strength and corrosion resistance, are described in a booklet which also lists its uses in modern industry. Bulletin Ka-175.

Heat Treating Line—An attractive catalog of heat treating products is published by Park Chemical Co. It starts out with a very useful diagrammatic thermometer showing the temperature and ranges for the various heat treating, melting and other processes requiring heat. Bulletin Oy-141.

Hydraulic Tester—Of interest to all engineers recommending or purchasing universal testing machines is a book by Riehle Division of American Machine and Metals, Inc., on the development of the precision hydraulic testing machine. Bulletin Ba-157.

Forging Tolerances—Standard tolerances for forgings recently adopted by the forging industry are fully explained by tables and other technical information in an interesting 8-page booklet made available by the Drop Forging Association. Bulletin Bb-123.

Hardness Testers—A handy thing to have around for anyone who does much hardness testing is a complete and detailed catalog of the universal line of hardness testers carried by Pyro-Electro Instrument Co., together with information on various specialized pieces of auxiliary equipment. Bulletin Fb-197.

Carburizing Salt—A technical service bulletin describing a new development—DuPont Carburizing Salt—for the economical production of deep high-carbon cases on plain carbon and alloy carburizing steels . . . available through DuPont. Bulletin Dc-29.

Air-Operated Controllers—A representative list of 50 applications where Brown Air-Operated Controllers are saving money is included in an attractive folder just released by The Brown Instrument Co. Bulletin Dc-3.

Thermometer—A Dial-Indicating Thermometer complying with the most exacting industrial requirements on applications dealing in temperatures from 0° F. to 1000° F. is described in a bulletin just released by Wheelco Instruments Co. Bulletin Dc-110.

The Review
7016 Euclid Ave., Cleveland

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Ec-89	Ec-226					Ka-49	Dc-3				
						Cc-61	Dc-110				

For Free Booklets

Carburizing Compounds—Aerocarb Carburizing Compounds, the new development of the American Cyanamid & Chemical Corp., are described in Bulletin Dc-148.

Lead Bearing Steels—New bulletin describing remarkable new lead-bearing open-hearth steels which improve machinability from 20 to 40% and increase tool life without sacrificing desirable quantities of OH steels has been released by Joseph T. Ryerson & Son, Inc. Dc-106.

Multi-Point Pyrometer—The Alnor Rectangular Type Pyrometer, designed to provide a rugged moderately priced instrument with multi-point switch is described in a release by the Illinois Testing Laboratories, Inc. Dc-180.

Stainless Electrodes—An attractive silver and black Wall Chart packed full of useful information for the welding fabricators of stainless steel and special alloy metals can be obtained through Arcos Corp. Write early since limited supply available. Bulletin Dc-191.

Heat Resisting Castings—A 4-page folder on Pyrasteel, heat resisting castings, that shows applications of special alloy steels and their analyses, also information on welding alloy steels, is available through Chicago Steel Foundry Co. Bulletin Cb-184.

Steeloscope—The Spekker Steeloscope is a specialized spectroscope for the rapid estimation of metallic elements in steel. Its use as a reliable workshop instrument is described in an illustrated booklet distributed by Jarrell-Ash Co. Bulletin Dc-96.

Duronze III—A technical bulletin covering Duronze III, a patented high strenth silicon-aluminum bronze, has just been released by the Bridgeport Brass Co. Describes typical uses and shows comparative tables. Ac-163.

Heat Treating Guide—A convenient guide for heat treating Columbia Tool Steels is now available in a bulletin published by Columbia Tool Steel Co. This device with revolving index shows grades, types, analyses, heat treating temperatures and Rockwell hardnesses. Bulletin Cc-115.

Electric Control—A complete control system for regulating input in proportion to demand is described in "Micromax Electric Control," an illustrated eight-page catalog issued by Leeds & Northrup Co. Bulletin Oy-46.

Continuous Heat Treating—First literature available on their No. 29-F Heating Machine is now available through the American Gas Furnace Co. Shows picture of machine and gives operating data. Bulletin Bc-11.

Heat Resisting—A striking booklet by Driver-Harris Co. has some interesting information and photographs of heat resisting alloys for heat resisting applications. The company makes a wide variety of parts from Nichrome, Chromax and Cimet. Bulletin Cb-19.

Tool Steels—Information about the fine steels made by the Uddeholm Company of America, Inc., can be obtained by requesting their new bulletin. This company controls its output completely from the ore mine to the consumer. Bulletin Eb-196.

Recording, Control Equipment—Now available from Baldwin-Southwark Corp. is a new 8-page bulletin illustrating and describing Southwark's complete line of stress-strain recorders and extensometers. Bulletin Bc-67.

Bright Annealing—Various types of electric and fuel-fired furnaces built by the Electric Furnace Co., for bright annealing wire, tubing, strip and other products are described in an 8-page folder. Bulletin Lb-30.

No-W High Speed—J. V. Emmons, metallurgist for Cleveland Twist Drill Co. and largely responsible for the development of the molybdenum-tungsten high speed steels known as Mo-Max, has prepared a general description of these new steels. Bulletin Ka-103.

Ni-Cr Castings—Compositions, properties, and uses of the high nickel-chromium castings made by The Electro Alloys Co. for heat, corrosion and abrasion resistance are concisely stated in a handy illustrated booklet. Bulletin Fx-32.

Abrasive Cleaning—Comprehensive information on airless abrasive metal cleaning is contained in a book on the "Wheelabrator" Tumblast, a patented mechanical device made by the American Foundry Equipment Co. Fa-112.

Tool Steel Guide—A 36-page booklet which gives a clear picture of the entire range of tool steels and their fields of use, plus a systematic method for selecting the right steel for the purpose, is being released by Bethlehem Steel Co. Bulletin Bc-76.

Cadalyte "38"—A new technical service manual on CADALYTE "38" for cadmium plating has been issued by the Electroplating Division of duPont. Cites recent improvements and changes in the product, and gives detailed operating instructions and methods of analyses. A table of costs and time required for specified deposits is included. Bulletin Gb-29.

Lectromelt Furnaces—The story behind lectromelt furnaces is well told in this 48-page booklet issued by the Pittsburgh Lectromelt Furnace Corporation. Tells of development and recent improvements. Bulletin Db-18.

High Frequency—The well-known Ajax-Northrup electric furnaces are excellently catalogued in a 22-page book, which covers all sizes and types for laboratory or shop. Includes illustrations, diagrams, tables and charts. Ajax Electrothermic Corp. Bulletin Ia-41.

Welding Instructions—Primarily concerned with methods of showing welding on drawings by the American Welding Society's new symbol system, an attractively bound 81-page booklet entitled "Welding Instructions and Standards, Part I" has been published by the United States Steel Corp. Subsidiaries. Bulletin Cb-79.

Neophot—"Neophot" is the name of a metallograph of radically different design and universal adaptability. A pamphlet distributed by Carl Zeiss, Inc., gives its applications and features and is well illustrated with beautiful samples of micrographic work. Bulletin Jx-28.

Hardness Testing—A 4-page folder which has as its purpose "to give you an idea of how practical a thing it is to make hardness tests on raw stock or fabricated metal parts in all plants where metal is worked, and to suggest something of the necessity for making such tests, or at least their importance" is available through the Wilson Mechanical Instrument Co., Inc. Bulletin Fb-22.

Lubrication—Intensive research which completed important improvements in the field of heavy-duty gear and bearing lubrication is tabulated in a new 12-page illustrated bulletin just released by D. A. Stuart Oil Co., Ltd. Lb-118.

Easy Flow Brazing—Handy & Harman's Easy-Flo Brazing Alloy, a recent development, is recommended for joining stainless steel and iron, Monel metal, Inconel, Everdur and other ferrous and non-ferrous metals. Briefly described in Bulletin Ny-126.

Heroult Furnace—Revised and expanded to include modern major innovations in the construction and operation of the Heroult electric furnace, the latest edition of the American Bridge Co.'s Heroult Electric Furnace Bulletin is available for distribution. Bulletin Bb-124.

Seamless Tubes—Prepared by the Timken Steel and Tube Division of Timken Roller Bearing Co. is a "Guide for Users of High Temperature Steels," which presents technical data relating to the various properties of Timken seamless tubes. Bulletin Bb-71.

Stainless Data Book—All users of stainless and heat resisting alloys should find invaluable the information contained in a booklet published by Maurath, Inc., giving complete analyses of the alloys produced by the different manufacturers, along with the proper electrodes for welding each of them. Bulletin Jy-125.

Galvanizing—An informative, historical, simple digest of galvanizing forms a guide to longer life for iron and steel products. This handsome, handy, 24-page book beautifully printed in color is distributed by American Hot Dip Galvanizers Association, Inc. Bulletin Ea-167.

Defi Rust—Analysis and descriptive notes of nine types of heat and corrosion resisting steels made by Rustless Iron and Steel Co. are contained in a handsome folder. Bulletin Ha-169.

Carburizer—Modern is the furnace and modern is the catalog which describes it. Hevi Duty Electric Co. has an exceptionally well-written, well-illustrated, and artistically printed booklet on the Hevi Duty carburizer which uses the Carbonol process. Bulletin La-44.

Development of Low Alloy Steel Has Difficulties

Effect of Alloying Elements not Additive; Balanced Analysis Requires Many Tests

By J. Z. Briggs

New York Chapter—A joint dinner and meeting with the American Welding Society were held on April 10.

In introducing the speaker, Technical Chairman J. H. Critchett, vice-president of Electro Metallurgical Corp., emphasized the importance of such talks now when text books are out of date before they are printed.

A. F. Stuebing of Carnegie-Illinois Steel Corp. spoke on "Low Alloy Structural Steels" with particular reference to "Cor-ten".

The four properties that low alloy structural steels must have are strength, corrosion resistance, abrasion resistance, and weldability. The difficulties in the development of such steels are tremendous, since the effect of the alloying elements is not additive, and many tests are required to arrive at the proper balanced analysis.

Increased Phosphorus a Radical Move

The chromium-copper steels had been investigated by Saklatwalla in 1922; the chromium added strength, while even rather small amounts of copper increased the resistance to atmospheric corrosion. An increase in the silicon to 1% raised the yield point-tensile strength ratio and slightly improved the corrosion resistance, while increased phosphorus doubled the corrosion resistance and added increased strength.

At the time Cor-ten was developed, the increased phosphorus content was a radical move, but now six out of seven low carbon, low alloy steels have around 0.1% phosphorus.

The chromium-silicon-copper-phosphorus steels of which Cor-ten is an example were the first low cost, corrosion resisting, high strength steels, the first structural steels with low carbon and manganese but high phosphorus, and the first low alloy steels with exceptionally high tensile strength and yield point-tensile strength ratios.

Proper Design Important

To utilize these steels properly, they must be designed with due consideration of the fact that the modulus of elasticity (and therefore the deflection of beams) is the same as for all steels. As an example of proper design, the use of the low alloy, high strength steels has enabled a 50% increase in permissible stresses in freight cars with a 26 to 29% decrease in weight.

The forming properties are much superior to carbon steels of comparable strength, but these materials cannot always be worked in the same manner as mild steel. In machining more power is required and lower speeds should generally be used than for mild steel.

Service results on freight cars have shown the quality of welded low alloy, high strength steels; arc welding, spot welding, and Union-melt welding have given excellent results.

The widest application of these steels has been in transportation equipment (buses, trains, trucks, etc.) where the decreased weight has led to appreciable economies in operation.

At the conclusion of his talk, Mr. Stuebing presented an excellent film on Cor-ten. The lively discussion that followed showed the great interest of the members of both societies in the practical use of such steels.

Melting Talk Ranges From 2-Oz. Castings To 480,000-Lb. Ingot

By A. W. Demmler

Pittsburgh Chapter—H. P. Rassbach of the Midvale Co. gave a very interesting presentation of "Electric Steel Melting" on April 13.

A full house turned out for the talk, the scope of which ranged from 2-oz. castings to 480,000-lb. ingots which require the tapping of several open-hearths at the same time. Open-hearth was compared with electric furnace practice.

We normally consider an electric arc furnace as a pretty versatile tool, but Midvale goes this one (or several) better with the flexibility of acid or basic open-hearths, Heroult or Rennerfelt arc furnaces and Ajax high frequency furnaces. With such a melting shop almost any steel chemistry is possible.

The speaker stressed the importance of an empiric approach to melting problems. Inclusions in connection with slag control were also discussed; of course, a higher iron oxide occurs in the open-hearth than in the electrics.

A heat that melts in low may not clean up as readily as one of higher carbon. These inclusions, incidentally, are "metallurgical dirt" as differentiated from entrapped slag, and the particle size is in proportion to the freezing rate or section size.

Concerning temperature, the melter's trained eye is still *the* optical pyrometer among all types. Temperature is an extremely vital factor in casting some of the high alloy compositions.

In connection with gas absorption, moisture, hydrogen, nitrogen and conditions of the carbon arc were discussed in considerable detail.

Of course, no talk involving forging steels would be complete without "flakes". Hydrogen is behind the eight ball and the acid open-hearth has the cleanest bill of health.

Qualitative Analysis Using Spectrograph Finds Stray Elements

By C. M. Strickler

York Chapter—Harry W. Dietert gave a lecture on March 23 in Breidenbaugh Science Hall at Gettysburg College on "Modern Analysis of Metals".

The spectrograph and carbon and sulphur determinator, through the rapidity with both qualitative and quantitative results are obtained, enable the laboratory to provide reports that guide the shop in processing materials.

The speaker deplored our present day tendency to be concerned only with four to six elements present in a metal. Much progress is to be had when the metallurgist will also become qualitatively minded and examine his metals for influencing stray elements as can readily be done by spectrographic analysis.

The operating technique of 2-min. carbon and 5-min. sulphur determinators was fully described with the aid of slides. It was claimed that the speed of determinations did not reduce their accuracy.

For spectrographic analysis of metals a cast or core drilled test specimen ⅛ in. in diameter by ¾ in. in length was recommended.

A projection-comparator, which projects a master spectrogram and the unknown spectrogram on a screen, was used to give a practical demonstration as to how qualitative and quantitative analyses are made after the light given off by an excited specimen is photographed on a piece of film 12½ in. in length.

Before the audience a spectrogram of cast iron was examined, showing the following elements:

Present in measurable quantity: Iron, silicon, nickel, chromium, manganese, copper, molybdenum, aluminum, calcium, titanium, cobalt, and lead.

Present in traces only: Germanium, tin, zirconium, tellurium, cadmium, lutecium, ytterbium, tungsten.

Good Design, Knowledge Of Solidification Important Factors in Sound Castings

By M. A. Hughes

New Jersey Chapter—At the meeting on April 17, Chairman G. M. Rollason announced the results of the election of officers for the 1939-1940 season (to be published in a later issue).

The speaker of the evening, Roy A. Gezelius of the Taylor-Wharton Iron & Steel Co., gave a most interesting talk on steel castings before a joint meeting of A.S.M. and A.F.A. members and their guests.

He pointed out that there are many factors to be considered in making a sound casting. Not only is good design an important factor but knowledge of progressive and directional solidification must be kept in mind if sound castings are to be produced.

It was shown that at temperatures just below the solidification point the strength of cast steel increases rapidly with a comparatively slight decrease in temperature. Thus cracking may occur in heavy sections that are adjacent to lighter sections which, due to more rapid cooling, are considerably stronger.

The effect of mass on physical properties was discussed. Although physical properties decrease as size of section increases, the average properties in the small and large sections will be sufficiently high to meet standard specifications.

Numerous lantern slides of data, graphs, and finished castings were shown and helped materially in a better understanding of the subject.

Boston Chapter Has A Military Meeting

(Continued from page 1)

portation, finance, and raw materials —the last-named is perhaps most important.

While the United States is particularly favored in this respect, it still lacks adequate domestic supplies of manganese, nickel, chromium, tungsten, aluminum, antimony, tin, rubber, wool, coconut shell char, manila fiber, mica, optical glass, quartz crystal, quicksilver, quinine, and silk.

Of this list of strategic materials, Gen. Harris discussed in detail manganese, tin, chromium and tungsten.

The audience listened with close attention through the 45 min. of the talk and held the speaker an additional 45 min. in discussion.

Fitch Recuperator Co. Organized

A new company organized as the Fitch Recuperator Co. has taken over the engineering and sales of the recuperator formerly known as the Carborundum Co. recuperator, covered by the Fitch patents.

The Refractory Division of the Carborundum Co. will continue to supply the "Carbofrax" tubes constituting the heat transfer elements used in this type of recuperator.

Members Visit Navy Yard

By Monte E. Parker

Puget Sound Chapter—On Wednesday, April 5, the members left Seattle on the streamlined ferry, Kalakala, for Bremerton.

The afternoon was spent in visiting the Puget Sound Navy Yard shops and laboratories, escorted by the Bremerton A.S.M. members.

Following the visit, dinner was served at the Elks Temple in Bremerton, and Commander Moran of the Navy Yard shops regaled the assembly with his experiences around the world.

Beryllium Corp. Expands

The Beryllium Corp. of Pennsylvania has announced the completion of new, specially designed facilities for the commercial production of heat treated beryllium alloys in rod, strip, and wire forms at Reading, Pa.

Hitherto, the company has supplied master alloys only in the ingot and cast form. Now it will be possible to obtain 2 to 2.25% beryllium-copper, beryllium-cobalt-copper, beryllium-chromium-copper, beryllium-nickel, and other alloys in the primary fabricated shapes.

The beryllium-copper alloys possess high electrical conductivity and tensile strength, elastic stability, resistance to fatigue, heat and wear, and uniform hardening characteristics.

Patent Law Series Concluded in Chicago

By Arnold L. Rustay

Chicago Chapter—The concluding lecture and discussion on "Essentials of Patent Law" covered the granting and use of patents.

When an individual or corporation is granted a patent by the United States Patent Office, it gives the patentee the right to control the manufacture, use and sale of the article or process protected by the patent. The patentee may legally exclude all others from making, using or selling the device or he may permit as many outlets as he chooses by issuing licenses.

These licenses may be qualified to permit only manufacture, use or sale, or they may be worded to cover any desired combination of these three features. Furthermore, the license may be limited to any definable political subdivision.

An assignment is a complete renunciation of all rights by the patentee, for a consideration, in favor of the assignee.

As Mr. Dienner concluded his lecture, he listed salient points to be observed.

First and foremost—avoid litigation; it is expensive, time consuming and the outcome is often dependent on judicial opinion if facts are not decisive. Negotiation that leads to compromise is to be preferred whenever possible.

Do not rely on a single broad patent to protect an invention; patent each distinctive feature of the invention; it is much easier to beat one patent than a dozen.

A patent covers only that which is shown and described in the drawings and specifications; broad claims may lead to charges of infringement.

Comparative Membership Standings of the Chapters

The following list shows the relative membership as of May 1 of the various chapters of the American Society for Metals. The actual membership of each chapter is not given, the figures merely representing the number of members each chapter has less than the chapter listed next above. The numbers in parentheses indicate the relative position of each chapter last month.

(1)	Chicago	Largest	(27)	North West	4
(2)	Pittsburgh	37	(25)	Tri-City	3
(3)	Detroit	74	(29)	Dayton	3
(4)	Cleveland	87	(28)	Schenectady	2
(5)	Philadelphia	80	(31)	Columbus	2
(6)	New Jersey	150	(30)	Oregon	6
(7)	New York	5	(33)	St. Louis	4
(8)	Boston	76	(34)	York	6
(9)	Montreal	42	(32)	Baltimore	3
(10)	Ontario	2	(35)	Syracuse	3
(11)	Milwaukee	27	(37)	Rhode Island	4
(14)	Lehigh Valley	14	(36)	Indianapolis	1
(12)	Los Angeles	2	(38)	Mahoning Valley	3
(15)	New Haven	6			
(13)	Rochester	1	(39)	Penn State	4
(17)	Cincinnati	13	(40)	Springfield	7
(16)	Texas	7	(41)	Notre Dame	11
(19)	Golden Gate	5	(43)	Puget Sound	7
(18)	Peoria	1	(42)	Southern Tier	2
(20)	Hartford	15	(45)	Rockford	1
(21)	Buffalo	4	(46)	Mich. Col. M.T.	4
(26)	Washington	19	(44)	Muncie	1
(24)	Canton-Mass.	2	(47)	Mo. Schl. M.M.	15
(23)	Worcester	5	(48)	Va. Poly. Inst.	14
(22)	Calumet	2			

Four Research Positions To Be Filled at Battelle

Four appointments as research associates are to be made at Battelle Memorial Institute, Columbus, Ohio. University and college graduates who have shown aptitude for research are eligible, with preference given to those who have specialized in physics, chemistry, metallurgy, fuels or ceramics.

Appointments are for one year, and may be extended for a second year. The salary is $1800.

Application forms and further information may be secured by writing to Clyde E. Williams, director.

LETTERS TO THE EDITORS

Of The Forging Handbook

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. . . of great value not only to the commercial Forging Industry, but to . . . the entire Metal Working Industry . . . Raymond M. Seabury,
Drop Forging Association.

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Emil F. Gibian,
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. . . easy to see this book is the result of years of experience and study . . . James E. Tomer,
The Locke Machine Co.

. . . impressed at once with its completeness and thoroughness . . .
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T. A. Gallittee,
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Positions Open

SALES REPRESENTATIVES: To sell nationally known line of heat resisting and stainless steel castings. Commission basis only. In reply advise lines you are now handling, district covered and your previous business experience and technical training. Box 4-5.

SALESMAN: Thoroughly acquainted with trade using tool steel, quenching oil, etc. Prefer married man about 35. Box 5-50.

Positions Wanted

METALLURGIST or HEAT TREAT FOREMAN: 29; Carnegie Tech Night School. Eight years experience in heat treating, foundry work, chemical analysis, metallography, physical testing, analysis of tool and machine part failures. Now employed. Box 5-5.

ANALYTICAL CHEMIST-METALLOGRAPHIST: M.S. from Purdue University. Well trained in metallography, alloy and technical analysis, and quantitative spectrographic analysis; specialty alloy steel analysis. Age 23. Box 5-10.

PHYSICAL METALLURGIST: 29; desires teaching position in large university. Ph.D. candidate; three years industrial experience. Very successful as teacher and in handling students. Excellent recommendations; available September. Married; good health. West or Midwest preferred. Box 5-15.

METALLURGIST: Age 21; junior at Michigan College of Mining and Technology; desires some form of physical metallurgy work for the summer in order to gain experience. Excellent references. Box 5-20.

POWDER METALLURGIST: Desires position of supervision or development of powdered metal products. Graduate metallurgist; five years experience in fabricating powdered metal products, development and research. Box 5-25.

METALLURGIST: Would like position in purchasing department or supervising or testing and heat treating. 13 years experience as director of metallurgy in engine plant, handling microscopic work, heat treatments, physical testing, inspection of material. Box 5-30.

SALES ENGINEER: Experience in hardness testing equipment and allied lines; desires position in eastern states. Excellent following. Age 33; married. Box 5-35.

HEAT TREATER: University of Michigan junior in metallurgical engineering desires summer employment as a practical heat treater or laboratory assistant. Four years practical experience in commercial and industrial heat treating establishments. Experienced in operation of all types of furnaces as well as testing equipment. Box 4-25.

SALESMAN: B.S. in business administration, 1924. Seven years experience selling and designing fabricated steel structures. Also experience in other lines. Employed for past five years by large finance company. Desirous of getting back into steel sales. Box 4-30.

YOUNG ENGINEERING GRADUATE, 31, desires connection with manufacturer of industrial equipment as sales promotion manager. Experience in technical and in various advertising activities for promoting sales to industrial men through publicity. Box 4-35.

METALLURGICAL ENGINEER: '36, age 24. Three years practical experience in a metallurgical laboratory, including metallography, development work, solution of production difficulties and field troubles, on wide variety of metals. Desires position with a future. Now employed; excellent references. Box 5-40.

METALLURGIST: B.S. in metallurgical engineering 1930. Six years plant experience in quality control, heat treating, physical testing and microscopical analysis of iron and steel; three years in research on tin plate, galvanizing and sheet products. Operating end of steel industry as plant metallurgist or sales engineer desired. Location in eastern states preferred. Box 5-45.

MANUFACTURING EXECUTIVE: Capable factory manager with broad, diversified experience. Thorough knowledge of modern production methods, purchasing materials, costs, equipment and plant upkeep. Successful with labor relations. Now employed; location immaterial. Box 5-55.

TOOL STEEL REPRESENTATIVE: Wide experience in marketing of high grade tool and alloy steels. Desires connection with producer of fine tool steels. Years of experience and splendid sales record in tool steel line admirably qualify this man for a responsible connection. Cleveland territory preferred but not essential. Box 5-60.

HIGH GRADE STEEL SALESMAN: Located in Cleveland territory many years; desirous of contacting concerns for purpose of establishing sales agency. Box 5-65.

METALLURGICAL SALES: Ferrous or non-ferrous. Age 25, B.S. in metallurgy. Three years plant and laboratory experience in steel, copper and aluminum; one year as foreman in non-ferrous smeltery. At present sales correspondent and in direct sales for large automotive accessories manufacturer. Excellent business and personal references. Box 5-70.